

28. Optical proximity switch as claimed in claim 22, wherein the transmitter is a laser diode.

29. Optical proximity switch as claimed in claim 23, wherein the receiver is a large-area photodiode.

30. Optical proximity switch with a housing, wherein an optics module and an electronics module are located in the housing;

wherein the optics module is pivotally mounted in the housing for rotation around a longitudinal axis thereof.

31. Optical proximity switch as claimed in claim 30, wherein the housing has two side walls which are at an angle to one another;

wherein a light passage opening is provided in each of the side walls and the optics module is pivotally mounted in the housing enabling the optics module to be selectively aligned with either one of the two light passage openings.

32. Optical proximity switch as claimed in claim 30, wherein two side walls of the housing are at an angle to one another and are connected to one another by a cylindrical sector-shaped wall section having a continuous light passage opening; and

wherein the optics module is pivotally mounted in the housing for positioning at any area of the light passage opening. - -

REMARKS

By the above actions, the specification has been amended and claims 1-20 have been canceled. Claims 21-32 have been added to incorporate the subject matter of the originally presented claims with the following detailed changes: Independent claim 21 combines original claims 1, 6, and 9; dependent claim 22 incorporates additional limitations of originally presented claim 2; dependent claim 23 incorporates additional limitations of originally presented claim 3; dependent claim 24 incorporates additional limitations of originally presented claim 4; dependent claim 25 incorporates additional limitations of originally presented claim 5; dependent claim 26 incorporates additional limitations of

originally presented claim 7; dependent claim 27 incorporates additional limitations of originally presented claim 8; independent claim ~~28~~³⁰ combines originally presented claims 1 and 10; dependent claim ~~29~~³¹ incorporates additional limitations of originally presented claim 11; dependent claim ~~30~~³² incorporates additional limitations of originally presented claim 12; dependent claim ~~31~~²⁸ incorporates additional limitations of originally presented claim 19; and dependent claim ~~32~~²⁹ incorporates additional limitations of originally presented claim 20. The original claims were canceled and these new claims added for clarity and readability for examination. In view of these actions and the following remarks, reconsideration of this application is requested.

The above amendments to the specification effectuate the minor revisions to the specification required by the Examiner. Thus, the objection to the disclosure should now be withdrawn.

Claims 6-9 and claim 12 stand rejected under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention due to the existence of antecedent basis problems. New claims 21-24 have been re-worded to eliminate the deficiencies noted by the Examiner and to insure that the claims clearly define the subject matter which Applicants regard as the invention. Accordingly, Applicants request that the rejection under 35 U.S.C. § 112 be withdrawn and favorable consideration of claims 21-24 and claim 32 is solicited.

Claims 1-4, 6-8, and 19-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by Pidhirny et al. United States Patent Number 5,786,586 (hereafter, the '586 patent). Insofar as this rejection applies to new claims 21-24 and new claims 26-29, this rejection is traversed for the reasons set forth below.

The '586 patent discloses a handheld optical reading device for reading two dimensional indicia on the surface of a data carrier substrate. This optical reader provides a positional and directional indicator to the operator that the reader is properly positioned and directed with respect to the indicia being read. Figures 1 & 2 show that the components necessary for the optical reader are not separated into an optics module and an electronics module. Further, the '586 patent discloses, "[a]n assembly 37 is disposed in the rear of the reader head 15. Mounted thereon is a light source 38 which can be an LED, microlaser or the like, and an imaging device such as a photodiode, CCD array, CID or CMOS imaging array 34, which must be optically shielded from the light source 38" (column 4, lines 39-43).

The optics module with the light source 38 and the electronics module with the imaging array 34 are not separated from one another but are mounted together on the assembly 37.

In contrast, claim 21 of the present invention recites an optical proximity switch with a housing, wherein an optics module and an electronics module are located in the housing, wherein the housing contains a receiving means and the optics module has an engagement device by which the optics module is attached in the housing by engagement of the engagement device in the receiving means, and wherein the housing has two side walls at an angle to one another and a light passage opening in one of the side walls, wherein the engagement device of the optics module is adapted to enable the optics module to be installed in the housing in at least two different orientations which correspond to an alignment of the optics module relative to the light passage opening. The '586 patent fails to teach or suggest an optical proximity switch, nor does it teach or suggest an optics module having an engagement device by which the optics module is attached in the housing by engagement of the engagement device in the receiving means.

The '586 patent instead teaches that the support member 30 is stabilized by an outer retainer 40 mounted in the housing 12 (see, column 5, lines 7-8). In the '586 patent, the support member is part of the actuator assembly and is braced by the retainer 40 (see, column 5, lines 30-39) rather than having the optics module attached in the housing by an engagement device in the receiving means as recited in claim 21. Further, the '586 patent fails to teach or disclose that the optics module may be installed in the housing in at least two different orientations as recited in claim 21.

Since the '586 patent fails to teach or suggest each and every element recited in independent claim 21, the '586 patent does not, and could not anticipate the present invention. Therefore, Applicants respectfully request that the rejection of independent claim 21 under 35 U.S.C. § 102(b) be withdrawn.

Likewise, claims 22-29 are dependent upon claim 21, and Applicants respectfully request that the rejection under 35 U.S.C. § 102(b) be withdrawn for the reasons set forth above with regard to independent claim 21.

Claims 5 & 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pidhirny et al. United States Patent Number 5,786,586 (hereafter, the '586 patent). Insofar as this rejection applies to new claims 21 and 25, this rejection is traversed for the reasons indicated above and as set forth below.

As already noted '586 patent discloses a handheld optical reading bar for reading two dimensional indicia on the surface of a data carrier substrate. This optical reader provides a positional and directional indicator to the operator that the reader is properly positioned and directed with respect to the indicia being read. The optical reader of the '586 patent consists of an optics head 15 which the Examiner has likened to the electronics module in the present application. However, the electronics module 3 in the present invention is separate from the optics module 2. The present invention comprises these two separate modules to solve the problem in the optical proximity switch art, namely the difficulty in aligning the transmitting and receiving means of the switch. Instant claim 21 recites, *inter alia*, "...an optics module and electronics module are located in the housing...wherein the optics module is adapted to enable the optics module to be installed in the housing in at least two different orientations which correspond to an alignment of the optics module relative to the light passage opening." The '586 patent is not directed to the optical proximity switch arts and therefore does not realize the alignment problems. In fact, the '586 patent discloses that the hand held optical reader employs a guide 420 that fully encompasses the incident beam (see column 6, lines 4-6 of the '586 patent). Therefore no positioning or alignment is employed. The device is self-contained in that once the frustum of the cone is positioned by the operator over the indicia to be read, the entire assembly is self contained. The '586 patent does not teach or suggest the use of an engagement device of the optics module adapted to enable installation in at least two different orientations. As such, it is submitted that the rejection under 35 U.S.C. § 103(a) should be withdrawn.

Further, there is no motivation or suggestion in the '586 patent to use a flexible, foldable conductor film in the electronics module as is recited in the present application in claim 25. The '586 patent does not disclose the ability of the optics module to be installed in the housing in at least two different orientations as recited in instant claim 21, nor does it teach or suggest the use of a flexible foldable conductor film in the electronics module. In fact, the rigidity and integrity of the one-piece hand held device is the key to its ability to provide an actuator for the optical reader (see column 3, lines 15-18 of the '586 patent). Further, the size of the housing guide in the '586 patent is dimensioned to surround indicia and provide a depth of field for particular indicia (see column 3, lines 19-23). Using a flexible, foldable conductor film for the purpose of decreasing the size would be inapposite when an object is to maintain a predetermined focal length (see column 3, lines 39-44).

Further, in the '586 patent, the distance from the rear portion of the lens assembly is fixed so that the angular field of view of the lens assembly is fixed for a given lens aperture and depth of field (see column 6, line 64 to column 7, line 1). The '586 patent fails to teach or suggest the use of a flexible, foldable conductor film, and therefore the Examiner fails to establish a *prima facie* case of obviousness since there is no suggestion in the '586 patent, nor does the Examiner make any reference to any prior art that would provide this suggestion. Therefore, Applicant respectfully requests that the rejection of claims 21 and 25 under 35 U.S.C. 103(a) be withdrawn.

Claims 10-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pidhirny et al. United States Patent Number 5,786,586 (the '586 patent) in view of Walter United States Patent Number 4,568,827 (hereafter the '827 patent). Insofar as this rejection applies to new claims 30-32, this rejection is traversed for the reasons set forth below.

Claim 30 recites an optical proximity switch with a housing, wherein an optics module and an electronics module are located in the housing, wherein the optics module is pivotally mounted in the housing for rotation around a longitudinal axis thereof.

In contrast, the '586 patent discloses a handheld optical reading device for reading two dimensional indicia on the surface of a data carrier substrate. The '586 patent fails to disclose an optical proximity switch with a separate optics module and electronics module located in the housing. The '586 patent, instead, discloses that the optics module and electronics module are co-located in the housing (see column 4, lines 39-43 of the '586 patent). The '586 patent discloses, "An assembly 37 is disposed in the rear of the reader head 15. Mounted thereon is a light source 38 which can be an LED, microlaser or the like, and an imaging device such as a photodiode, CCD array, CID or CMOS imaging array 34, which must be optically shielded from the light source 38." Please see column 4, lines 39-43 of the '586 patent. The optics module with the light source 38 and the electronics module with the imaging array 34 are not separated from one another but are mounted together on the assembly 37.

Additionally, the '827 patent discloses an optoelectronic sensor device in which there is a housing attachment on the housing of the optoelectronic sensor device that can be turned relative to the housing, and in this way, enable emission or reception of light from different directions. In the '827 patent, the optoelectronic sensor device is not a compact device, nor is the optics module located in the main housing but, instead, is installed in an additional

attachment 12, which is mechanically complex and susceptible to damage. The '827 patent fails to disclose a pivotally mounted optics module installed in the housing, but rather is a separate assembly that must be mounted and adjusted separately from the main housing. In contrast, the present invention incorporates the adjustment of the optics module in the housing itself. That is, once the housing is mounted, the optics module is adjusted without affecting the spatial positioning of the rest of the housing. Adjustments are made internally to the optics module rather than to an appendage housing as in the '827 patent (see Fig. 1 and Fig. 2 and column 3, lines 57-61 of the '827 patent). This important modular distinction leads to better reliability of adjustment in the instant invention and a device that is less susceptible to positioning problems (see present application, paragraphs [0009], [0010], [0016], and [0019]).

Since the '827 patent fails to teach or suggest the use of a pivotally mounted optics module in the housing as recited in claim 30, Applicants respectfully assert that rejection of claim 30 under 35 U.S.C. § 103(a) is improper, and request that the outstanding rejection under § 103 be withdrawn.

Applicants note that claims 31 and 32 are dependent upon claim 30 and respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn for the reasons set forth above with regard to independent claim 30.

Further with regard to claim 31, it is noted that, while the '586 patent discloses a housing that has two side walls at an angle to each other, the '586 patent fails to teach or suggest a light passage opening provided in each of the side walls enabling the optics module to be selectively aligned with either one of the two light passage openings. Further, since the '586 patent is directed to a handheld device that uses an open end of a truncated cone or pyramid to envelope the indicia to be read and the operator aligns the hand-held device from behind the reader (see column 3, lines 1-14), side walls are not utilized to selectively align the optics module with either of the two light passage openings as recited in new claim 31. Therefore, the '586 patent does not teach or disclose this feature, or further provide any motivation to modify references to incorporate the limitations of new claim 31, and the Examiner fails to establish a prima facie case of obviousness. As such, rejection of new claim 31 under 35 U.S.C. § 103(a) is improper and should be withdrawn.


Additionally, with regard to claim 32, Applicants note that the '586 patent fails to disclose an optics module pivotally mounted in the housing for positioning at any area of the

light passage opening as asserted by the Examiner. Further, the only adjustment means disclosed in the '586 patent is with regard to the light beam angle of divergence (see column 4, line 62 to column 5, line 6) rather than the position of the optics module and beam as recited in claim 32. Therefore, the '586 patent does not teach or disclose this feature, or further provide any motivation to modify references to incorporate the limitations of new claim 32, and the Examiner fails to establish a prima facie case of obviousness. As such, rejection of new claim 32 under 35 U.S.C. § 103(a) is improper and should be withdrawn.

The prior art which has been cited but not applied by the Examiner has been taken into consideration during formulation of this response. However, since this art is not any more relevant than that relied upon by the Examiner and was not considered by him to be of sufficient relevance to applied against the original claims, no detailed discussion thereof is believed warranted at this time.

While the present application is now believed to be in condition for allowance, should the Examiner find some issue to remain unresolved, or should any new issues arise, which could be eliminated through discussions with applicant's representative, then the Examiner is invited to contact the undersigned by telephone in order that the further prosecution of this application can thereby be expedited.

Respectfully submitted,

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MARKED-UP VERSION SHOWING CHANGES MADE

In the Specification:

Please amend paragraph numbers [0001], [0009], [0019], and [0020] to read as follows:

[0001] The invention relates to an optoelectronic sensor device with a housing, especially an optical proximity switch, such as a reflex light momentary contact switch or a sensor device for a one-way or reflected light photoelectric barrier. These optical proximity switches have [as the transmitting components, therefore as the] light-emitting components, typically diodes, and preferably laser diodes as the transmitting components. Receiving components are generally large-area photodiodes. These optical proximity switches can be divided essentially into three different types, specifically into one-way systems, reflection systems, and momentary contact switch systems.

[0009] By separating and dividing the components necessary for the optoelectronic sensor device into the optics module, on the one hand, and the electronics module, on the other, a type of modular system is accomplished. This means that, depending on the requirements for the optoelectronic sensor devices, especially depending on the direction of light emission or reception which is necessary based on the installation situation of the optoelectronic sensor devices, at outside dimensions which are the same each time, specifically with the same housing, optoelectronic sensor devices with a transmitter and a receiver on different sides are available, and they can be produced from a small number of components which can be installed differently. In the simplest case, one such sensor device according to [in] the invention can be built using an optics module and an electronics module which are installed in the housing, depending on the installation position of the optoelectronic sensor device, in different orientations. In an essentially rectanguloidal optoelectronic sensor device with one narrow side and one wide side, thus, there can be an optics module both for emission and reception of light on the narrow side and also alternatively on the wide side.

[0019] It was noted above that one problem in optoelectronic sensor devices is their accurate and reproducible positioning when installed in a corresponding system.

Occasionally, it is necessary to temporarily uninstall[,] the optoelectronic sensor device in order to acquire, for example, access to an otherwise blocked area of the system. Here, it is desirable that the optoelectronic sensor can be easily uninstalled and then can be installed again reliably as the original installation situation and alignment of the optoelectronic sensor device are restored.

[0020] Accordingly, a further object of the invention is to provide an optoelectronic sensor device which enables simple, reliable and reproducible installation and alignment.